

TLP561J

Triac Driver  
Programmable Controllers  
AC-Output Module  
Solid State Relay

The TOSHIBA TLP561J consists of a zero voltage crossing turn-on photo-triac optically coupled to a gallium arsenide infrared emitting diode in a six lead plastic DIP package.

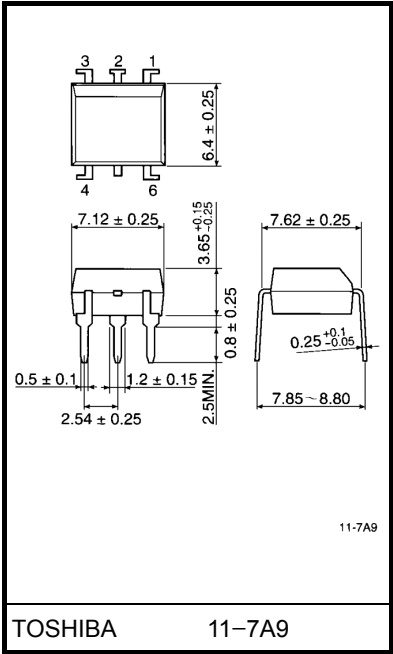
- Peak off-state voltage: 600V(min.)
- On-state current: 100mA(max.)
- Isolation voltage: 2500V<sub>rms</sub>(min.)
- UL recognized: UL1577, file no. E67349
- Isolation operating voltage: 2500V<sub>ac</sub> or 300V<sub>dc</sub> for isolation Groupe C\*<sup>1</sup>
- Trigger LED current

Classi- Fication*	Trigger LED Current (mA)		Marking Of Classification
	V <sub>T</sub> =6V, Ta=25°C		
	Min.	Max.	
(IFT7)	—	7	T7
Standard	—	10	T7, blank

\*Ex. (IFT7); TLP561J(IFT7)  
(Note ): Application type name for certification test, please use standard product type name, i.e.  
TLP561J(IFT7): TLP561J

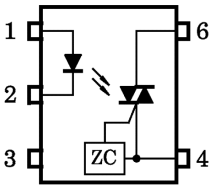
\*1: According to VDE0110, table 4.

Unit in mm



Weight: 0.39g

Pin Configuration (top view)



- 1 : ANODE
- 2 : CATHODE
- 3 : N.C.
- 4 : TERMINAL 1
- 6 : TERMINAL 2

## Absolute Maximum Ratings (Ta = 25°C)

Characteristic		Symbol	Rating	Unit
LED	Forward current	$I_F$	50	mA
	Forward current derating (Ta ≥ 53°C)	$\Delta I_F / ^\circ\text{C}$	-0.7	mA / °C
	Peak forward current (100μs pulse, 100pps)	$I_{FP}$	1	A
	Reverse voltage	$V_R$	5	V
	Junction temperature	$T_j$	125	°C
Detector	Off-state output terminal voltage	$V_{DRM}$	600	V
	On-state RMS current	$I_{T(RMS)}$	100	mA
			50	
	On-state current derating (Ta ≥ 25°C)	$\Delta I_T / ^\circ\text{C}$	-1.1	mA / °C
	Peak on-state current (100μs pulse, 120pps)	$I_{TP}$	2	A
	Peak nonrepetitive surge current (Pw = 10ms)	$I_{TSM}$	1.2	A
	Junction temperature	$T_j$	115	°C
Storage temperature range		$T_{stg}$	-55~125	°C
Operating temperature range		$T_{opr}$	-40~100	°C
Lead soldering temperature (10s)		$T_{sol}$	260	°C
Isolation voltage (AC, 1min., R.H. ≤ 60%)		$BV_S$	2500	V <sub>rms</sub>

Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) are within the absolute maximum ratings.

Please design the appropriate reliability upon reviewing the Toshiba Semiconductor Reliability Handbook ("Handling Precautions"/"Derating Concept and Methods") and individual reliability data (i.e. reliability test report and estimated failure rate, etc).

## Recommended Operating Conditions

Characteristic	Symbol	Min.	Typ.	Max.	Unit
Supply voltage	$V_{AC}$	—	—	240	V <sub>ac</sub>
Forward current	$I_F$	15	20	25	mA
Peak on-state current	$I_{TP}$	—	—	—	A
Operating temperature	$T_{opr}$	-25	—	85	°C

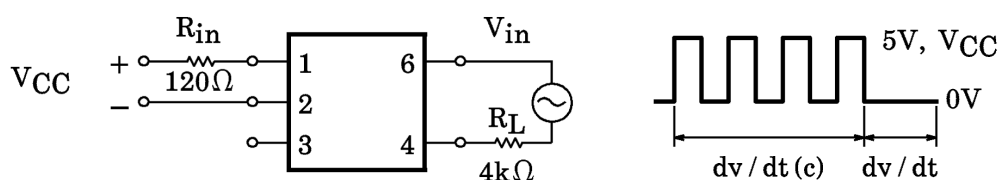
Note: Recommended operating conditions are given as a design guideline to obtain expected performance of the devices. Each item also has its own independent guideline document. In developing designs using these products, please confirm the specified characteristics shown in these documents.

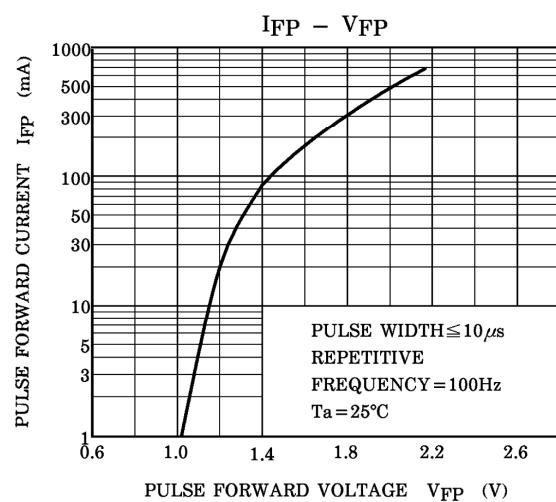
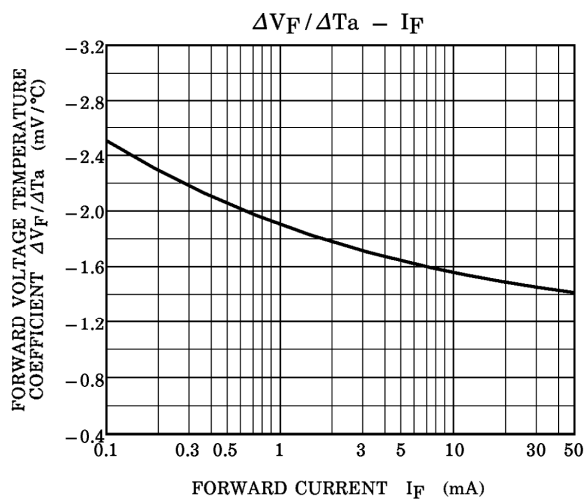
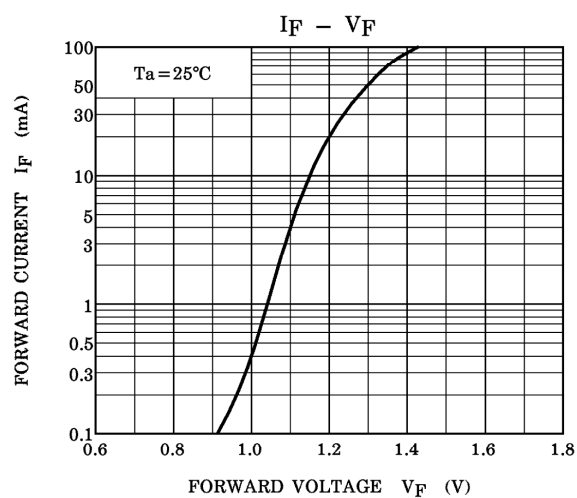
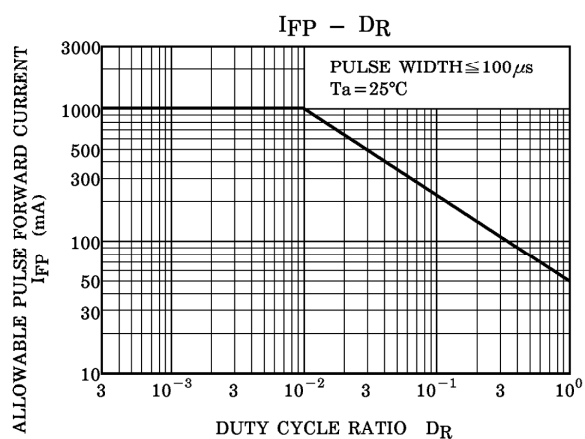
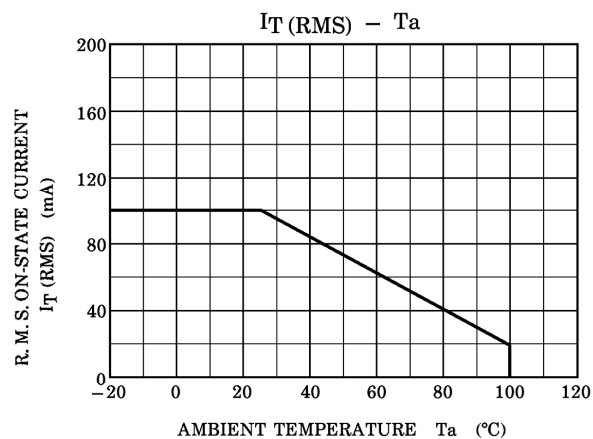
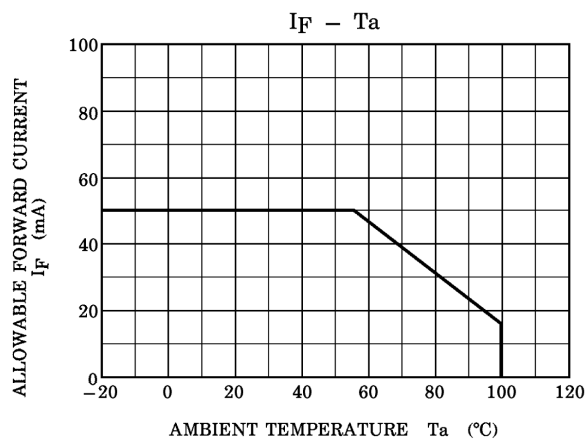
## Individual Electrical Characteristics (Ta = 25°C)

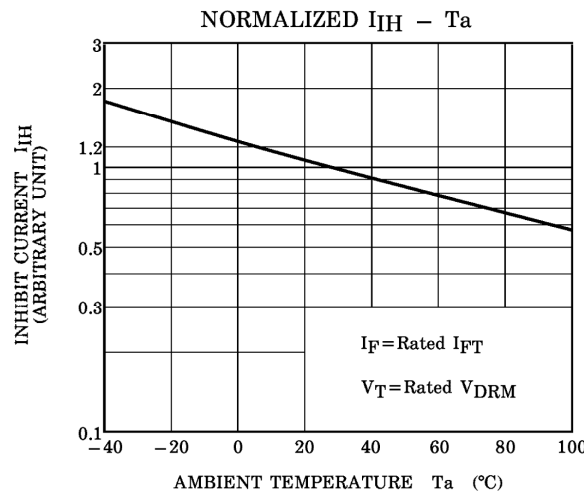
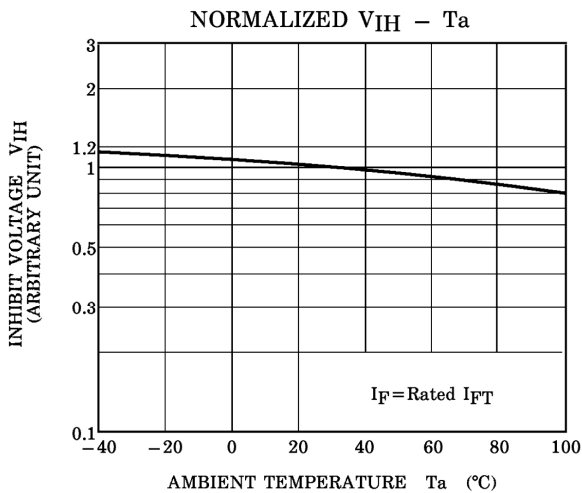
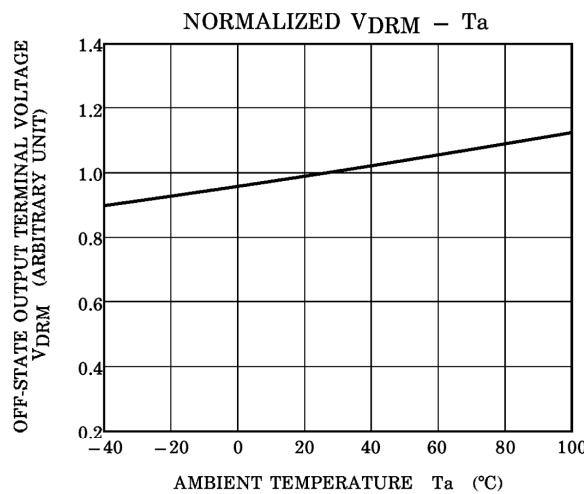
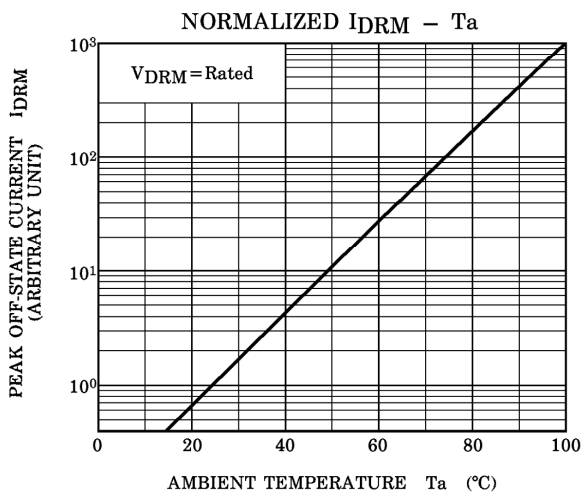
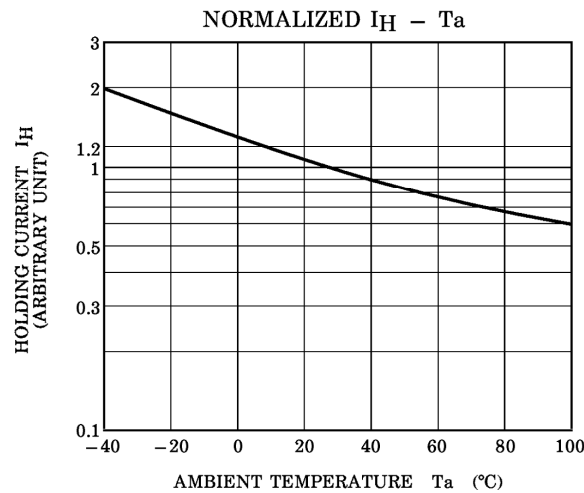
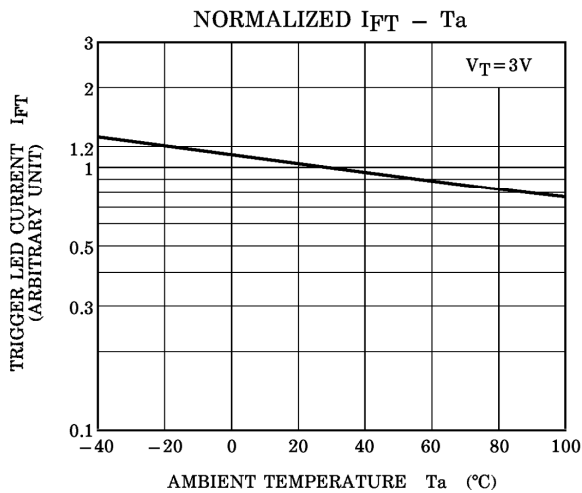
Characteristic		Symbol	Test Condition	Min.	Typ.	Max.	Unit
LED	Forward voltage	$V_F$	$I_F = 10\text{mA}$	1.0	1.15	1.3	V
	Reverse current	$I_R$	$V_R = 5\text{V}$	—	—	10	$\mu\text{A}$
	Capacitance	$C_T$	$V = 0, f = 1\text{MHz}$	—	30	—	pF
Detector	Peak off-state current	$I_{\text{DRM}}$	$V_{\text{DRM}} = 600\text{V}$	—	10	1000	nA
	Peak on-state voltage	$V_{\text{TM}}$	$I_{\text{TM}} = 100\text{mA}$	—	1.7	3.0	V
	Holding current	$I_H$	—	—	0.6	—	mA
	Critical rate of rise of off-state voltage	$dv/dt$	$V_{\text{in}} = 240\text{V}_{\text{rms}}, T_a = 85^\circ\text{C}$ (Fig.1)	200	500	—	V / $\mu\text{s}$
	Critical rate of rise of commutating voltage	$dv/dt(c)$	$V_{\text{in}} = 60\text{V}_{\text{rms}}, I_T = 15\text{mA}$ (Fig.1)	—	0.2	—	V / $\mu\text{s}$

## Coupled Electrical Characteristics (Ta = 25°C)

Characteristics	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Trigger LED current	$I_{\text{FT}}$	$V_T = 6\text{V}, R_L = 100\Omega$	—	5	10	mA
Inhibit voltage	$V_{\text{IH}}$	$I_F = \text{Rated } I_{\text{FT}}$	—	—	50	V
Leakage in inhibited state	$I_{\text{IH}}$	$I_F = \text{Rated } I_{\text{FT}}$ $V_T = \text{Rated } V_{\text{DRM}}$	—	200	600	$\mu\text{A}$
Capacitance (input to output)	$C_S$	$V_S = 0, f = 1\text{MHz}$	—	0.8	—	pF
Isolation resistance	$R_S$	$V_S = 500\text{V}$	$5 \times 10^{10}$	$10^{14}$	—	$\Omega$
Isolation voltage	$BV_S$	AC, 1 minute	2500	—	—	$V_{\text{rms}}$
		AC, 1 second, in oil	—	5000	—	
		DC, 1 minute, in oil	—	5000	—	$V_{\text{dc}}$

Fig.1:  $dv/dt$  test circuit





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